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ACUTE PULMONARY TUBERCULOSIS

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PART I

A concise description of the types or forms of pulmonary tuberculosis is difficult, because tuberculosis is a general infection having its chief manifestation, in most cases, in the lungs; and because of the complexity of tuberculous lesions, the great variety of the clinical features, and the extent to which the infection is a mixed one. In some patients the symptoms are very pronounced, though the lesions are slight; in others the lesions are extensive and easily discernible, but with slight clinical manifestations. Here, as ever in medicine, we have to consider the individual condition of each patient, rather than an artificial scheme into which the given case should fit. Still, for purposes of study we have to have some logical classification, such as the following: I. Acute general miliary tuberculosis. II. Acute pulmonary miliary tuberculosis. III. Acute pneumonic tuberculosis. IV. Acute bronchopneumonic tuberculosis. The first two of these types are distinctly hematogenous infections. As regards the third and fourth types: Acute pneumonic tuberculosis is very like lobar pneumonia, but much graver even than that serious disease; we may consider acute pneumonic tuberculosis a pneumonia in which the essential and specific factor is the tubercle bacillus. The like is to be observed concerning acute bronchopneumonic tuberculosis and bronchopneumonia; the former is practically a bronchopneumonia in which the tubercle bacillus is the essential or specific factor and it is correspondingly a much graver disease. The terms "galloping" or "hasty consumption," "fulminating tuberculosis" and "florid phthisis" have been applied rather indiscriminately to one or the other of these four types.

I. ACUTE GENERAL MILIARY TUBERCULOSIS

In this disease the tubercle bacilli have become disseminated throughout the body by way of the blood vessels, the result being the formation of tubercular nodules (in size from a millet seed to a hazel nut) in many organs and tissues. Here the pulmonary lesion is only a part (nor is it a distinct one) of the general process. The meninges are also frequently affected; so often, indeed, that tubercular meningitis is a distinct type, which will not be exhaustively considered here.

The pathology. The Koch bacillus gets into the circulation by the rupture into a blood vessel of a caseous (and especially an unencapsulated) tubercular nodule; or by the softening and ulceration of a tubercular focus in the wall of an artery or a vein. There is in most cases, to begin the mischief, an old primary focus somewhere in the body, which breaks down and discharges its contents into a vessel. This primary focus may be latent in a lymphatic gland (cervical or elsewhere); and when we recall the very intimate anatomic relation of the lymphatics to the blood vessels we must conclude that a miliary tuberculosis frequently comes from this source. Nor are tubercles rare in the walls of the vessels themselves. They have frequently been found in the walls of the thoracic duct; and of course the passage of tubercle bacilli into the great veins emptying into the right heart must follow. The primary focus may be in the pulmonary vein, or in the tissues drained by it; thence the bacilli would readily enter the left ventricle and thus be easily distributed throughout the body by the systemic circulation.

Other veins and arteries either have isolated ulcerating foci in their walls or are carriers and distributors of the bacilli; such foci have been found in the jugular veins, the vena cava superior, the suprarenal veins, the aorta and so forth. If the bacilli should break only into small arterial twigs the miliary tuberculosis might be localized in a small and fairly circumscribed area. Other tissues in which primary tubercular nodules are found on autopsy are those of the pleura, the lungs, the endocardium and the myocardium, the bones (in tubercular caries especially), the bone marrow, the joints, the genito-urinary tract, the intestinal tract, the peritoneum, the spleen, the thyroid gland, and the meninges.

One may in a measure account for the very varying character of the symptoms and their great complexity by considering both the Koch bacillus and its toxins in miliary tuberculosis. It seems that the bacilli themselves do not multiply in the blood. In those cases resembling typhoid fever as to symptoms, the toxins of the bacilli liberated into the blood stream are unusually virulent and destructive in their effect upon the economy; besides, mixed infection, especially with the streptococcus, frequently obtains. Other factors to be noted are: the patient's capacity for absorbing toxins, the relative number of the bacilli, and the amount of toxins in circulation. The discharge from a recent, more active focus of infection is more virulent than from old attenuated germs in a non-progressive and long standing process; there may be successive crops from the one focus; the body may be overwhelmed by egress, all about the same time, into the blood, from several places. Thus may be explained acute exacerbations of the disease and the altogether atypical temperatures. It is considered that the systemic infection is due to the toxins and that local manifestations are due to tubercle formation.

The symptoms. In children a previous infection, such as pertussis or measles, is very suggestive: as also the possibility of a latent tuberculosis, as indicated by the history of an old lymphangitis or of a bone or joint lesion. In adults the previous history should also be carefully studied; an old pleurisy is a very frequent forerunner of tuberculosis in any form. Profound emotional disturbance has been found causative, no doubt by exciting a latent lesion.

There is usually a prodromal period of malaise or failing health, broken sleep, restlessness, anorexia; with dyspepsia, very decided weakness, loss of flesh and strength, chilly and febrile sensations. Or more rarely the onset is sudden, and then we have the serious symptoms of a general infection with pronounced local manifestations, when any one part of the body (as for instance the meninges) is especially affected. The fever obtrudes itself upon the attention and demands study. In the evening it may be high (to 104°), and lower in the morning (to 102°), possibly even subnormal (this may mislead into the diagnosis of typhoid fever); or the temperature period may be "inverse," high in the morning and low in the evening; or it may seem intermittent, suggesting malaria; or it may be generally low throughout the disease; or it may be utterly atypical, irregular, hectic or septic. The observations above made as to pathology will explain such temperature vagaries. The cheeks burn with the fever, and yet there is pallor of the lips and cheeks; there may be herpes and there is frequently profuse and cold perspiration.

The pulse soon becomes rapid, feeble, soft, compressible, perhaps dicrotic; it is the pulse of a grave and rapidly weakening infection. There is leucocytosis.

The pulmonary symptoms are not marked, not nearly so much as in acute pulmonary miliary tuberculosis. There is bronchitis, but not much more than such as accompanies any infectious disease; the cough may be slight or even absent; should the tubercle bacillus be found in the sputum, this would of course prove at least some form of tuberculosis. There may be hemoptysis; and perhaps nose-bleed. Cheyne-Stokes respiration toward the end would indicate, not necessarily a pulmonary lesion, but rather the hopeless general condition of the patient.

There are digestive disturbances; intense thirst, vomiting, constipation (rather more frequent than diarrhoea). The tongue is that of a grave fever—dry, brown in the center, red at the edges, with sordes; but not so pronounced, nor with breath so offensive, as in typhoid fever. Tubercle bacilli in the urine would positively indicate broken down nodules somewhere in the genito-urinary tract.

The nervous symptoms must be emphasized, by reason of their frequency in this disease; they come about through tubercles in the meninges, and through pressure from effusion into the lateral ventricles: there is headache, probably frontal, intolerance of light, double vision or squint or dilated pupils; tubercles may be discovered in the choroid. There is muttering delirium, which will change, as the disease progresses, to stupor and then to coma. In children there may be the "hydrocephalic cry," active delirium or convulsions. Accordingly, as various cortical centers in cranial nerves are involved, we get hyperesthesia, muscular pains and twitches, reflex changes; retraction of the abdomen; paralyses. This meningeal tuberculosis is frequently "terminal" to the general infection.

The pulmonary *physical signs* are meagre and are no indication of the severity of the general miliary tuberculosis; there may indeed be very little pulmonary involvement. There is evidence of bronchitis, but no more than in any other acute infection. On inspection we note the face flushed or cyanosed; emaciation as the disease progresses. The bronchial fremitus should be elicited; the percussion note may be slightly dull; dullness if marked, especially near the apex, should indicate some previous lesion, probably tubercular. There may be hyperresonance, by reason of relaxed pulmonary tissue.

The diagnosis. This is oftentimes difficult, because in the beginning, at least, the symptoms are systemic or general in character, and local lesions are not so manifest; however lung or meningeal involvement is very suggestive of miliary tuberculosis. The infection most misleading is typhoid fever: malaria and malignant endocarditis must also be differentiated. A family tubercular history is suggestive, and a previous history of pulmonary tuberculosis, of a bone or joint lesion, of a lymphangitis, a pleurisy, pertussis or measles, or of the many factors predisposing to tuberculosis, should suggest this disease.

As between acute general miliary tuberculosis and typhoid fever many cases of this form of tuberculosis have been mistaken for typhoid and the symptoms are so similar that we speak of a typhoid-like general miliary tuberculosis. Progressive emaciation is marked in both diseases; cases of the latter have been treated for weeks or months on the assumption of their being typhoid. To increase the difficulty of diagnosis, pulmonary invalids may develop typhoid and *vice versa.* However, it is noteworthy that the development of acute general miliary tuberculosis is not characteristic; on the other hand most cases of typhoid are fairly regular and characteristic. We are helped by the knowledge of typhoid cases in the family or of epidemics in the neighborhood.

In acute miliary tuberculosis the pulmonary or meningeal symptoms may be marked. The temperature should be very informing: in miliary tuberculosis it is irregular as described, generally not so high as in typhoid, and is better reduced by baths or ice-packs; the typhoid temperature chart is fairly typical and well-known. Bronchitis is likely in both diseases: tubercle bacilli in the sputum would of course settle the question; respirations are rather more frequent in miliary tuberculosis. The pulse is more rapid earlier in miliary tuberculosis. Dicrotism and interrupted pulse are perhaps more likely in typhoid; but here we get little help. The finding of tubercule bacilli in the blood demonstrates tuberculosis; but their absence means nothing. The positive Widal indicates typhoid. There is leucocytosis in miliary tuberculosis, but not in uncomplicated typhoid. The face is pallid in tuberculosis, flushed in typhoid; herpes is more likely in the former, sordes and offensive breath are more marked in typhoid. There may be an eruption, especially about the wrists, in tuberculosis; but petechiae (rose spots) especially on the trunk, indicate typhoid. Abdominal symptoms (meteorism, etc.) are more marked in typhoid; but tubercular peritonitis must be considered. Constipation is more likely in miliary tuberculosis; diarrhoea, with loose yellow and perhaps bloody, stools, in typhoid. Splenic enlargement is more marked in typhoid. Jaundice may mean many miliary tubercles in the liver. The Diazo-Ehrlich reaction may be had in both diseases; much help is not here to be had. However we may note that in miliary tuberculosis the reaction is considered not to come until the fifteenth day, then to continue until the end of the disease, and to indicate, if it persists, an advancing and incurable condition: in typhoid the reaction should come between the fifth and thirteenth days, not later than twenty-two days, and if not found within three weeks there is either no typhoid or a very mild case. Either tubercle bacilli, or typhoid bacilli, or both may be found in urine. It must be borne in mind that the two diseases may coexist in the same case.

Malaria may be mistaken for general miliary tuberculosis, by reason of the septic or intermittent temperature and cold perspiration. In malaria, however, the plasmodium is very evident in the blood, there is no Widal, no leucocytosis, and the spleen is pronouncedly enlarged.

As to malignant endocarditis: in miliary tuberculosis the local symptoms may be pulmonary or meningeal, rather than cardiac; the onset of malignant endocarditis is sudden, with characteristic blood changes, and this lesion may complicate or follow a disease of which the history is obvious.

The *prognosis* in acute miliary tuberculosis is very grave. Recoveries have been recorded. One doubts if the diagnoses have been correct in these cases. "Fulminating" cases may end in a few days; in any event death is seldom delayed beyond several weeks.

(*To be continued.*)

HOSPITAL CATERING

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What shall we have for breakfast?
What shall we have for tea?
A bit of steak, a chop or two,
Or a savory fricassee?

This is the daily problem of the woman who looks well to the ways of her household the world over, one that she solves according to her lights. If she happens to be informed as to food values, this knowledge is reflected in her decisions; if in addition to this knowledge she has also mastered the art of buying, blessed, indeed, is the household over which she presides. When the "anything so it's filling" hand to mouth system of catering and purveying prevails, it is a matter of health in spite of, rather than because of the fuel used for stoking the human engine; for, paradoxical as it may sound, it is nevertheless true, that one may be over-fed, yet actually starved in so far as real nourishment goes.

As with the housewife in the home, so it is with the housewife in that larger erstwhile home, the hospital. The same refrain, "What shall we eat?" is ever haunting her from sun to sun, except that in the latter case the responsibility is greatly multiplied because she must not only furnish the proper food-fuel for those of her large family who are in health, in order to keep them well and up to the working mark, but must also provide repair material suited to the rebuilding of the tissues laid waste by disease. Nor even then are her duties compassed; for, in addition, and most difficult of all, the capricious appetite of the sick must be coaxed and humored, a feature which should not be lightly passed over.

In hospital catering the two meals of the day that give the most concern because, of necessity, they are more or less monotonous, are break-